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MAY 23 2007

Docket No.: 358362010400  
(PATENT)

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:  
Masaou MATSUDA et al.

Application No.: 09/889,508

Confirmation No.: 5230

Filed: October 18, 2001

Art Unit: 1771

For: FLAME-RETARDANT POLYESTER FIBER,  
WOVEN OR KNITTED FLAME-RETARDANT  
POLYESTER FIBER FABRIC, NONWOVEN  
FLAME-RETARDANT POLYESTER FIBER  
FABRIC, AND WOVEN OR KNITTED SUEDE  
FABRIC

Examiner: J. A. Steele

APPELLANTS' REPLY BRIEFMS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This reply brief responds to the Examiner's Answer mailed March 23, 2007. Appellants are requesting an oral hearing of this appeal concurrently herewith.

ARGUMENT

## A. The Examiner incorrectly stated that there is no evidence that satisfying formulas 1-3 is related to the draw ratio.

As described in Appellant's Appeal Brief, since neither Leumer nor Tashiro disclose producing a fiber with the draw ratio utilized by Appellants, a fiber produced according to Tashiro and Leumer would not necessarily satisfy formulas (1)-(3) as claimed. In the Examiner's Answer the Examiner states "Applicant is arguing that the process of using a certain drawing ratio is different than the prior art process and that the claimed process leads to a different result, however

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there is not evidence of record to support this assertion.<sup>1</sup> The Examiner is incorrect. As explained below, Appellants have provided significant evidence that satisfying formulas 1-3 is related to the draw ratio.

The Declaration of Ryouji Nakamura was filed in this application on May 31, 2005. Mr. Nakamura's declaration recreated Example 10 of United States Patent No. 4,157,436 to Endo et al. As described in the declaration, a flame-retardant polyester fiber satisfying formulas 1-3 could not be obtained at a high draw ratio of 4.6, but could be obtained at a draw ratio of 2.88 or below. Accordingly, it is clear that a fiber produced at a draw ratio of 4.5-6.0 as described in claim 30 of Leumer would not result in a flame-retardant polyester fiber satisfying the formulas 1-3 in claim 1 of the present application.

In addition, the present specification states that increasing the draw ratio degrades the dyeing property of the fiber. For example, see page 17, lines 23-24. In addition, page 17, line 30- page 18, line 3, page 18, line 9 states:

The distance from the spinneret surface to the cooling air outlet should be not more than 80 mm, preferably not more than 70 mm. This is preferable because molecule arrangement of a completed yarn can be lowered by increasing the spinning tension by cooling as soon as possible after the polymer is discharged, thereby allowing the drawing under high deformation speed of the spinning to proceed as much as possible, and decreasing the draw ratio under the low deformation speed in the subsequent drawing step. When it exceeds 80 mm, cooling of the yarn becomes late and the spinning tension becomes lower. Thus, the drawing by spinning does not proceed to make the draw ratio in the drawing step higher, which in turn makes the molecular orientation higher and the dyeing property degraded. This has a consequence that the fiber has a  $\tan \delta$  max of less than 0.250 and the objective fiber of the present invention is difficult to obtain. . . .

Accordingly, the specification also explains the relationship between the draw ratio and  $\tan \delta$  max  $\geq 0.1740$  (formula 1).

<sup>1</sup> Examiner's Answer, page 11, lines 2-4.

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**B. Leumer fails to disclose or suggest lowering the draw ratio as suggested by the Examiner.**

On page 11, lines 9-13, of the Examiner's Answer, the Examiner states that "Leumer teaches it is of particular importance to maintain a drawing and setting temperature and a draw ratio making it possible to produce low flammability yarns having tenacity, breaking extension and modulus of elasticity comparable to the high tenacity yarns made of unmodified polyesters." Accordingly, the Examiner states that it would thus be obvious to modify the draw ratio to optimize the process. The cited portion of Leumer merely suggests that high strength can be obtained by increasing the draw ratio to an extremely high level. Accordingly, the cited portion actually teaches against lowering the draw ratio to satisfy formulas 1-3.

On page 11, lines 19-22, of the Examiner's Answer, the Examiner states, ". . . Leumer recognizes that the drawing and setting temperature and draw ratio are result effective variables which are directly related to the properties of flammability tenacity, breaking extension and modulus elasticity." Leumer merely discloses that a polyester containing a flame retardant can be used to produce a high-intensity yarn similar to a regular polyester yarn when the draw ratio is set to an extremely high value. Again, Leumer teaches away from lowering the draw ratio to improve the dyeing properties and to satisfy formulas 1-3.

Finally, on page 12 of the Examiner Answer the Examiner states that Leumer teaches a first draw ratio of 2.4-3.9, which overlaps the draw ratio of less than 2.88 as recited in claim 12. Leumer states that the yarns undergo two drawings, not one. Accordingly, a yarn that has only gone through the first drawing is an intermediate oriented yarn having no industrial value, which shows poor dimension stability due to its remaining fracture elongation of not less than 100%. Thus, Leumer does not suggest a method of producing a yarn with a final draw ratio of 2.4-3.9. Leumer only discloses producing a yarn with a total draw ratio of 4.5-6.0. In comparison, the present invention relates to a complete fiber which maintains dimension stability, which can be produced utilizing a low draw ratio. Further, the additional drawing utilized by Leumer would degrade the dyeing property and increases the shrinkage rate, which in turn makes it impossible to produce a flame-retardant polyester fiber having high dyeing property and high wear resistance, which is

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obtained by the claimed fibers. Accordingly, since Leumer fails to disclose or suggest a fiber produced with the claimed draw ratio a fiber produced according to Tashiro and Leumer would not necessarily satisfy formulas (1)-(3).

**CONCLUSION**

For the foregoing reasons, appellants respectfully request the Board reverse the final rejections of claims 1, 2, 4, and 6-12.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, appellants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing Attorney Docket no. **358362010400**.

Dated: May 23, 2007

Respectfully submitted,



By \_\_\_\_\_

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